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The Impact of Downtown Revitalization on Residential Home Prices: Evidence from Normal, Illinois

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Abstract

Studies have documented an increase in property values due to a desirable public construction project, but the effect of downtown redevelopment on residential house prices remains relatively unknown. This study analyzes the effects of a downtown revitalization project in the Town of Normal on surrounding neighborhoods' house prices. Results show residential house prices are not affected by downtown redevelopment, both before and during the construction of downtown revitalization projects. Results also indicate the amount of square feet, size of the house's garage, and year the house was built had the strongest effects on house price, reflecting a trend in the American housing market towards larger suburban houses.

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I. INTRODUCTION

Downtown revitalization projects are becoming popular in the United States. As energy prices rise and residents seek to live closer to where they work, local governments and property owners are rushing to redevelop downtowns, creating new apartments/condominiums, retail and dining opportunities for their residents. According to William Hudnut of the Urban Land Institute, "There is a wave of migration toward the historic central city" [1]. Downtown apartment and condominium prices reflect the increased demand. A newspaper in Columbus, Ohio reported that since 2003, "prices have nearly doubled" and "they have more buyers than units to sell" [2].

Revitalizing downtowns is also becoming more popular due to the benefits it provides to local governments. Besides increasing the tax base, revitalizing downtowns can reduce the city's cost of providing public services and protect essential local infrastructure. The National Trust Main Street Center, a program dedicated to assisting communities in revitalizing their downtowns, reported that between 1980 and 2004, over 67,000 businesses invested in local downtowns, creating 308,370 new jobs. Additionally, for each dollar used to operate a community's local Main Street program, an average return of $26.67 was generated [3]. Smaller cities particularly benefit from downtown redevelopment projects. Because the downtown district constitutes a significant proportion of the smaller city's tax base, redeveloping downtowns can greatly assist a small community's overall economic health. Does this evidence indicate a movement away from the suburbs and into downtown housing or residential areas close to downtowns?

Studies have documented the economic returns to investing in downtown revitalization projects, but the effect of these projects on residential house prices outside the redevelopment

area is relatively unknown. There is a large amount of literature analyzing the effects of other public projects on house prices, and results from a few of these studies can be related to the present downtown analysis. Studies on two of the most common downtown redevelopment strategies, historic preservation and creation of open/green space, indicate that both of these economic development tools have positive and statistically significant effects on neighboring residential areas' home values.[1] This would lead one to believe that downtown redevelopment efforts of historic preservation and creation of open/green space have positive effects on residential areas' house prices. In two studies, effects from the public project began having a significant effect on house prices even before construction of the project had been completed.

If downtown redevelopment causes effects similar to other public projects, house prices in neighborhoods surrounding the downtown should increase. If prices increase, what will be the effect on the overall housing market? Will prices in suburban areas decrease, stay the same, or increase? Could these effects discourage urban sprawl?

The purpose of this paper is to study the effects of a downtown redevelopment project in the Town of Normal, Illinois on house prices in the surrounding neighborhoods, specifically with the goal of determining if prices have appreciated between 2000 and 2005 due to the downtown renovation projects. By comparing sales prices of houses near the downtown to those farther away, effects of the downtown redevelopment project on house prices can be determined. Use of data in 2000 shows the price of houses in the Normal housing market before any downtown projects were planned or underway. By comparing this data with 2005 data, a comparison can be made of what effect the downtown revitalization project has had on house prices. Data is taken from the Bloomington-Normal Association of Realtors and includes all

[1] Richard Wagner, author of the *Downtown Development Handbook* (1992), points out that a "major development, such as a new festival marketplace" (open/green space) "or the rehabilitation and reuse of a major historic building" (historic preservation) "will be the catalyst for additional projects" (Listokin, *et al.*, 1998, pg. 443)

residential property sold in 2000 and 2005.[2] An analysis of this nature is important. Local government officials, business leaders, and residents have invested a considerable amount of capital into the renovation. If the renovation project has a positive and statistically significant effect on house prices, leaders would know downtown revitalization projects have positive spillover effects on other parts of the community. The positive spillover effects may indicate a movement towards downtown living and away from suburban preferences.

Another purpose of this study is to determine if the downtown redevelopment effort affects house prices before all construction is completed, similar to studies by Kiel and McClain (1995) and McMillen and McDonald (2004). Results from these studies indicate home prices will be affected by the public project before, during, and after construction is complete. If this occurs in downtown revitalization projects, it would benefit community leaders to begin advertising economic returns from the renovation before it is complete. This would attract businesses and developers earlier in the process, ensuring the community could repay loans expeditiously.

This study uses a unique approach to analyze the impact of the downtown revitalization project in Normal on house prices in the surrounding neighborhoods. Two methods, a hedonic model and the difference-in-difference estimator, are combined to examine the effects on appreciation rates in Normal. The hedonic approach accounts for other housing characteristics that could be affecting the price, while the difference-in-difference estimator captures the effects of the downtown redevelopment project on house prices.

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[2] The author acknowledges the Bloomington-Normal Realtors Association for this information. The author would also like to thank John Lovelass, from Coldwell-Banker Realty, for providing access to the BNAR database.

II. BACKGROUND OF THE TOWN OF NORMAL's RENEWAL PLAN

Downtown Normal extends from Fell Street in the west, to Linden Street in the east, Mulberry Street in the North, and Irving Street in the south (see Figure 1 in Appendix). Composed of approximately 10 blocks, its northern and western boundaries are adjacent to Illinois State University, a four-year university with nearly 20,000 students.

In 1999, the Normal Town Council realized the downtown was becoming neglected-buildings were deteriorating and there had been no substantial capital improvements in the last 20 years. In response, the Town hired a downtown design consulting company, Farr Associates, to determine if downtown redevelopment in Normal was feasible. After a series of public meetings, market studies, and interviews with local business owners, the Town of Normal created the Downtown Normal Renewal Plan and formed a tax increment financing (TIF) district in May 2003.[3] The TIF district, which includes downtown Normal, Town Hall, and a radius of approximately one-half mile around the downtown's center (see Figure 2 in Appendix), is designed to "attract private development and new businesses" and "retain existing businesses that might otherwise find more attractive options elsewhere" [4].

In January 2004, construction began on the Children's Discovery Museum in downtown Normal in the first phase of the Town's downtown redevelopment plan. By January 1, 2006, the Town had completed seven projects with ten more underway. The projects completed include a variety of residential units and offices, small restaurants and retail shops, a children's museum, and a mixed-use building. Projects underway include two more mixed-use buildings, two banks, a hotel/conference center, larger restaurant, improvements to the public infrastructure such as

[3] TIF, an economic development tool for "blighted" areas, has been frequently used to fund large-scale development projects. With TIF, the property value assessment for the specified area (TIF district) is frozen for a period of between 15 and 20 years. After the period concludes, the TIF authority sells the property to a developer and collects the gains from the property value.

better lighting and sidewalks, and a multimodal transportation center. The transportation center, a focal point for the Downtown Renewal Plan, will bring together all the public transportation options available in Normal, including Amtrack trains, regional buses, Bloomington-Normal Public Transit System buses, and airport shuttles. It will also house parking for taxis, bicycles, and automobiles. With the assistance of the Historic Preservation Commission, the Town has also designated four properties in downtown Normal with historic status.

The total cost of the Downtown Normal Renewal Plan is estimated at over $34 million [5]. Goals of the redevelopment are to increase economic activity, create jobs and income in the community, and positively impact surrounding neighborhoods and property values.

III. LITERATURE REVIEW

Previous studies have examined the impact of an exogenous event (policy change or change in current economic activity). According to Kiel and McClain (1995), "differences in appreciation rates capture the speed of adjustment to new price levels and are evidence of a disequilibrium in the housing market due to the presence of the facility" (public project) [6]. As such, house prices can be an indicator of whether the project is having a positive effect on community property values. To address the effects of downtown redevelopment on neighboring house prices, it is appropriate to first address studies with two common components of a downtown revitalization program and their effects on residential house prices: creation of open and green space (public parks, pedestrian walkways and trails, landscaping) and historic preservation.[4] Next, studies are analyzed that indicate how public projects have produced significant effects during construction, with the intent of analyzing if the same result can be

[4] The National Trust Main Street Center's Four Points to Commercial Revitalization lists a city's "best assets" for redevelopment as: historic buildings (preservation) and pedestrian-oriented streets (open space).

found in downtown revitalization projects. Finally, studies of the hedonic pricing model are examined, indicating which variables should be present in conducting this analysis.

Effects of open/green space and historic preservation

Studies analyzing the effects of open and green space on residential home prices are diverse, representing a variety of public projects such as golf courses, walking paths, and public parks. Irwin (2002) employs a hedonic approach to determine if open space has had positive land use spillovers on residential property values [7]. Using data from suburban and exurban counties in the Washington D.C.-Baltimore metropolitan area, Irwin classifies open space through six variables, three of which are relevant in this analysis: open space owned by federal, state, or county governments; higher density residential areas (such as downtown apartment living); and commercial/industrial development (retail districts in a downtown). Irwin's results show public open space had a positive and statistically significant effect on neighboring residential properties, relative to other developable areas, while commercial/industrial land uses and higher density residential areas had statistically significant negative effects. Bolitzer and Netusil (2000) further reinforce this conclusion [8]. Analyzing 1990-1992 data of single-family homes sold in the Portland, Oregon metropolitan area, the authors find that homes located a little more than a quarter mile (1,500 feet) from an open space increased the homes' sales prices by $2,262. Nichols and Crompton (2005) [9], studying a natural greenbelt consisting of 7.5 miles of multi-use trails and parking/restroom facilities to the west of downtown Austin, Texas, find that properties located between three-quarters and one mile away experienced a statistically significant increase of $28,715.[5] Results from these studies suggest downtown open spaces such as public parks and improved walkways/trails may cause neighboring residential house prices to

[5] These results were found in one neighborhood area- Lost Creek. Other areas produced statistically insignificant results.

increase. And although certain aspects of downtowns such as retail and high-density living areas have negative effects on surrounding house prices, open spaces such as trails, improved sidewalks, and public green spaces consistently have positive and statistically significant effects on house prices.

Several studies have analyzed the effects of designating a property or neighborhood as historic on neighboring home prices. Ford (1989) found that historic districts cause property values of houses within the district to increase [10]. Using data on transactions prices between 1980 and 1985 in the City of Baltimore, Ford finds that the high transaction costs associated with retaining the character of a house in the historic district assures the preservation of the house's condition.[6] Ford also finds that the externality effect created from one piece of historically preserved property is not certain until the property is part of an officially designated district. This is because the owner of the property has no guarantee that neighboring property owners will preserve their houses' condition.

Asabere and Huffman (1994) find that residential property in a historic district sold for as much as 26% more than houses outside the district [11]. As with Ford, Asabere and Huffman find the "premium" of owning a house in a historic district is directly correlated with the externality effects resulting from historic designation. Leichenko *et al.*'s (2001) study of nine selected cities in Texas finds historic designation generally had a positive effect on residential property values, with some historic areas being between five and twenty percent higher than non-designated areas [12]. And in relation to spillover effects on neighboring residential areas, Listokin *et al.* (1998) point out that historic district designation encourages renovation of other parts of the community, in areas where no properties have historic designation [13]. Buildings in

[6] To keep the historic district designation, property owners are required to maintain the house in a condition similar to the period it was built.

the downtown were usually the first erected, and as such, represent the most historical piece of the community. Although downtown historical properties usually are not houses, results from the studies presented indicate designation of main street areas and downtowns as historic districts should have a positive effect on property values, both within the downtown district itself and in neighboring residential areas.

Public projects' effects on residential home values

Studies investigating the effects of a public project on residential home prices have reported prices reacted to the public project before construction had began and while construction was in progress. McMillen and McDonald (1993) analyzed the effects of a new rapid transit line on single-family house prices in Chicago, Illinois [14]. McMillen and McDonald began their study in 1983, 10 years before the opening of the line, using data on prices of all houses sold in Cook County, Illinois for the years 1983-1999. Consisting of 17,034 individual house sales, the data set included 17 characteristics of the houses, as well as geographical location variables for twelve different communities, year-specific variables, and two variables examining the distance between the houses and rapid transit line and between the houses and downtown Chicago. Consistent with their hypothesis, McMillen and McDonald found that house prices increased substantially during the 17-year period. With 1986 as their base year, McMillen and McDonald's results indicated homes closer to the transit line appreciated almost 7% more than homes farther away. For their dataset, this represented an overall increase in property values equal to $215.9 million, or approximately $6,000 per home. Estimates from McMillen and McDonald's hedonic model showed that the project was anticipated by the housing market in 1987, six years before the new transit line opened. This

suggests public projects can have significant positive effects on property values, even before construction of the project has been completed.

Kiel and McClain (1995) also were interested in the effects of a public project on residential house prices, as they studied if housing appreciation rates are negatively affected by the construction of a garbage incinerator. Employing an income capitalization model, Kiel and McClain used a sample of 2,563 houses sold in North Andover between 1974 and 1992 to address at what stage in the incinerator's construction process housing appreciation rates become adversely affected [6]. The model includes variables for sales prices over time, housing and neighborhood characteristics, and a time trend variable to catch any appreciation or discounting. Results indicate that individual housing appreciation rates are affected by the incinerator, in both the incinerator's construction and operation phases. Kiel and McClain also note that house values may drop when news of the project is first heard in the community, even before any construction on the incinerator has begun. As more information about the project becomes available, house prices will continue to be affected. Again, as with the McMillen and McDonald study, Kiel and McClain's results show that new public projects have effects on residential home prices in surrounding areas before construction of these public projects has been completed.

III. MODEL AND ESTIMATION METHODS

Theoretical underpinnings for the hedonic pricing model are found in early studies of consumer theory by Lancaster (1966) and Rosen (1974). Lancaster suggested that consumers derive utility from the characteristics of the goods, rather than the goods themselves [15]. He also stated that each good possesses more than one characteristic, and that "by moving to multiple characteristics we can incorporate many of the intrinsic qualities of individual goods." Houses do not provide utility to a consumer; rather, it is the bundle of characteristics of a house

to which the consumer assigns utility (and intrinsic value). Expounding on Lancaster's idea, Rosen [16] described hedonic prices as "implicit prices of attributes that are revealed to economic agents from observed prices of differentiated products and specific characteristics associated with them." From this alteration, Rosen placed real value on each of the characteristics, allowing for the implicit prices of the good to be realized. What has evolved from Rosen and Lancaster's work is the standard hedonic pricing model, where the price of a house is treated as a function of its individual characteristics, or:

$$\text{Price} = f(\text{housing characteristics, exogenous factors})$$

Consumers will maximize the utility they gain from a house's characteristics, subject to their individual budget constraints.

A downtown redevelopment project could affect house prices if it is an important component of the bundle of housing characteristics. One potentially relevant attribute of the downtown is the proximity from the house to the downtown. Desirable social and recreational activities make the downtown an attractive location, and those residents whose houses are within walking distance would have an advantageous proximity to the downtown relative to those residents farther away. To examine the effect of various housing characteristics on the price of a house, a hedonic pricing model is developed, where sales price is examined as a function of its housing characteristics and the downtown location, an exogenous factor.

A difference-in-difference estimator is created to investigate the effects of the Town of Normal's downtown redevelopment project on surrounding houses' prices, using the Town's tax increment financing (TIF) district as a boundary between the downtown and residential areas. The TIF district is a reasonable boundary as it represents all the property in the downtown area that will be redeveloped or impacted by the redevelopment. Starting at the boundary, an

additional one-half mile radius is drawn around the TIF, and this area (TIF district and one-half mile radius) represents those houses that are near the downtown (within walking distance). House prices in this area are expected to be positively affected by their close proximity to the downtown. Houses outside the one-half mile radius are not expected to be impacted by the downtown renovation project, and consequently, appreciation rates are expected to be lower in these areas.

To estimate the difference between house prices in 2000 and 2005, the difference-in-difference estimator is utilized with the standard hedonic pricing model and estimated by OLS. An interaction term, *neartown05* ($y05 * neartown$), is used to measure the difference between houses sold near the downtown in 2000 and 2005, and 16 explanatory variables control for characteristics that may affect the price of a house. The model used for this analysis is below:

Equation (1)

$$\ln P_i = \beta_0 + \delta_0 y05 + \beta_1 neartown + \delta_1 y05 * neartown + \varphi X_i + u_i,$$

where P_i is the sales price of house i, β_0 is the average price of a house not near the downtown in 2000, and δ_0 is the change in all housing values in the Town of Normal between 2000 and 2005 (i.e. appreciation rates between 2000 and 2005), and β_1 measures the proximity effect that is not due to the presence of the downtown. X_i is a vector of the 16 housing characteristics and u_i is an error term. δ_1, on the interaction term $y05 * neartown$, measures how much house prices changed between 2000 and 2005 due to the presence of downtown redevelopment. This is the parameter of interest, and if its coefficient is positive and statistically significant, house prices will have increased because of the downtown redevelopment project.

Because prices will vary based on the value some houses place on additional characteristics,[7] the hedonic model is estimated in semi-log form. This allows price to be analyzed as a function of its individual attributes, so price can vary with each characteristic, and problems with heteroskedasticity reduced.[8] Additionally, the change in one of the explanatory variables can now be easily interpreted as a percentage effect on the price of a house. Advantages of using this model are that it accounts for the difference in the kinds of houses sold in 2000 and 2005, respectively, and using a hedonic model reduces the standard error for the difference-in-difference estimate, making results more statistically significant.

IV. DATA AND VARIABLE DESCRIPTIONS

Data Description

Data on the sales prices of all houses sold in Normal, Illinois, for the years 2000 and 2005 were provided by the Bloomington-Normal Association of Realtors (BNAR). Homes were identified by conducting a search in the BNAR database and selecting residential properties with prices between $100,000 and $1,000,000. Houses within this price range were chosen because properties with prices less than $100,000 may not be reflective of actual houses sold in Normal. For example, many rental apartments and other nontraditional housing options typically cost less than $100,000. Because this study's focus is on house prices, nontraditional living options are irrelevant. The database search engine requires an upper limit, so for the analysis, a limit of $1,000,000 was selected because no houses sold in 2000 or 2005 cost more than this amount.

A second component of the search was that all properties selected be residential and owner-occupied. This was done for two reasons. First, it is difficult to estimate the effects of the

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[7] Sirmans, *et al.*[17] give this example: A $500,000 house with five bedrooms and a $100,000 house with five bedrooms will be valued differently because one additional bedroom may be more highly valued for the $500,000 house than the $100,000 house.

[8] Sirmans, *et al.*, pg. 6.

downtown redevelopment project on rental housing within the TIF district and half-mile radius. In this location, there are several student apartment complexes, and including these in the dataset may not depict how house prices are affected by the downtown project. Second, choosing residential owner-occupied housing eliminates commercial properties. Although appreciation rates of commercial properties may be an indicator of economic growth, it is difficult to quantify how much of the growth is due to the effects of the downtown redevelopment project. Businesses could be producing profits from other economic factors, including strengthened productivity, technological advances, or more investment in capital.

The final selection criterion for the database search was that the properties have at least one bedroom. Again, this was chosen to eliminate nontraditional living options, such as mobile homes or studio apartments. Although the housing market is largely heterogeneous, making comparisons between houses with similar basic characteristics is ideal.

After conducting the database search, homes were coded as near the downtown or not near the downtown based on the distance between their respective neighborhoods and the downtown. There are 75 neighborhoods in the Town of Normal- to calculate distances between each of these neighborhoods and the downtown, one house was selected as a 'representative' of each neighborhood.[9] Then, using a computerized mapping tool, the distance was measured between each representative house and the TIF district. If the house was within the half-mile radius drawn around the TIF district or within the district itself, the house was considered "near the downtown." A dummy variable, *neartown*, took on the value of one if the house (neighborhood) was near the downtown and zero otherwise. Resulting from this process was a natural experiment, where houses coded as near the downtown (*neartown* = 1) were the treatment group and those coded as outside (*neartown* = 0) were the control group. In this way,

[9] Please see Figure 3 in the Appendix for a list of all the neighborhoods in Normal, Illinois.

an analysis of the effect of the downtown redevelopment project is possible, because it allows for a comparison between houses that were affected by the downtown and those not affected.

Variable Descriptions

Table 1 shows a description of each variable included in this analysis, and Table 2 shows their summary statistics. Variables representing physical housing characteristics were chosen using a study by Sirmans *et al.* (2005), where the authors list 20 statistically significant housing characteristics appearing most often in hedonic pricing model studies [17]. Other variables used in this analysis- student housing, historic district designation, school district, lake view, trail, attached garage, year, and distance to the downtown- were chosen to capture market-specific influences. The quadratic, age-squared, is used to capture the marginal effects of age on sales price of a home and augment the accuracy of the linear model.

Table 1: Variable Descriptions

Variable	Description
lsalesprice	Log of the sales price (in U.S. Dollars) a house is sold at
y05	= 1, if year 2005, 0 otherwise (2000)
neartown	= 1, if house is located near the downtown, 0 otherwise
neartown05	= 1, if house is located near the downtown in 2005, 0 otherwise
house	= 1, if house is characterized as a house, 0 otherwise
bdrms	number of bedrooms in a house
lsqrft	Log of number of square feet in a house
cars	number of cars that garage can accommodate
attgar	= 1, if garage is attached to house, 0 otherwise
baths	number of bathrooms in a house
stories	number of stories, or floors, a house has
age	age of a house, in years
agesq	age of a house squared, in years
fireplaces	number of fireplaces in a house
unit5	= 1, if the house is in Unit 5 School District, 0 otherwise (District 87)
lakeview	= 1, if the house has a view of a lake/pond, 0 otherwise
trail	= 1, if the house is located near Constitution Trail, 0 otherwise
histdistrict	= 1, if the house is in near a historic district, 0 otherwise

Table 2: Summary Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
lsalesprice	5.195	.121	5	5.621
y05	.640	.480	0	1
neartown	.112	.316	0	1
neartown05	.058	.235	0	1
house	.835	.371	0	1
bdrms	3.439	.672	2	6
lsqrft	3.217	.127	2.751	3.592
cars	2.029	.559	0	4
attgar	.895	.307	0	1
baths	2.542	.526	1	5
stories	1.555	.483	0	3
age	15.343	19.711	0	104
agesq	623.102	1361.210	0	10816
fireplaces	.793	.465	0	2
unit5	.994	.076	0	1
lakeview	.020	.141	0	1
trail	.045	.208	0	1
histdistrict	.006	.076	0	1

Number of Observations = 1,044

Expected signs of variables

From previous studies, it is expected that signs on *y05*, *neartown05*, *house*, *bdrms*, *lsqrft*, *attgar*, *baths*, *stories*, will be positive. Descriptions of the anticipated relationship between each variable and a house's sales price are below:

1. *y05* should have a positive effect on *lsalesprice*. House values have been steadily increasing in Bloomington-Normal- it is therefore expected that houses sold in 2005 would have higher prices than those sold in 2000, irrespective of their locations.
2. *neartown05* is expected to have a positive sign. From previous studies, it is clear that redevelopment projects generally cause house prices to increase. Houses sold in 2005, near the downtown and after some downtown redevelopment projects have been completed,

should be selling for a higher price than houses sold in 2005 that were not located near the downtown.

3. *house* should have a positive sign. Generally, houses are more expensive than condominiums or 'zero-lot' properties.[10]
4. *bdrms* should have a positive sign. If a house has more bedrooms, it is either larger or offers more diverse living arrangements for residents. From previous studies, the number of bedrooms has consistently had a positive and statistically significant effect on house price.
5. *lsqrft* is expected to have a positive sign. The amount of square feet is a good indicator of house size. Bigger houses are usually more expensive.
6. *attgar* is expected to have a positive sign. An attached garage is usually preferred to a detached garage, no garage, or a carport; the price of a house should increase if the house has an attached garage.
7. *baths* should have a positive sign. Like bedrooms, if a house has more bathrooms, there is usually more space. Having more bathrooms is also desired for larger families, as there is more privacy, and this should cause the price of a house to increase.
8. *stories* should have a positive sign. Houses with more stories are usually bigger, and this should increase the price of a house.
9. *fireplaces* is expected to have a positive sign. Previous studies indicate that number of fireplaces overwhelmingly has a positive effect on house price.
10. *unit5* is expected to have a positive sign. The Unit 5 school district is known for its quality, and houses located in areas where these schools are present should have higher prices.[11]

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[10] A zero-lot property generally requires some dedication of private open space. If owners must provide more open space on their property, they will have less space available to build, and this will decrease the size of their home.
[11] The Town of Normal is part of the twin city area with the City of Bloomington. Unit 5, located on the perimeter of the twin cities, and District 87, located closer to the center, are the two local school districts.

11. *lakeview* should have a positive sign. Generally, houses with a good view of a lake or pond are aesthetically pleasing and more expensive.
12. *trail* is expected to have a positive sign. The Constitution Trail is a greenway with walking, running, and biking options- living near the trail should cause house prices to increase.
13. *histdistrict* is expected to have a positive sign. Past studies indicate that historic designation has positive effects on house price.
14. *neartown* is expected to have a negative sign, indicating that houses close to downtown before the redevelopment (2000) were less expensive due to the neglect and deterioration of the downtown at that time.
15. *age* should have a negative relationship with sales price. Older houses may have structural problems and require time and effort to maintain. New houses often allow the buyer to choose his/her characteristics for the house, providing greater utility- older houses may limit accessibility to a consumer's preferences. The sign of the quadratic *agesq* is expected to be positive, indicating as houses get older, age will have a diminishing effect on house price.[12]

V. ECONOMETRIC ANALYSIS

Results from Equation (1)

The results from estimating Equation (1) are reported in Table 3. Variables behaved as anticipated except *stories*, *unit5*, *neartown*, *neartown05*, *trail*, and *histdistrict*. Of these, *stories* and *unit5* had unexpected negative signs, and *neartown*, *neartown05*, *trail*, and *histdistrict* were not statistically significant.

[12] The quadratic is used to account for positive effects of historic properties. As a house gets older, age is expected to have less of a negative effect on price.

Table 3: OLS Results from Equation (1) using the Difference-in-Difference Estimator and Hedonic Pricing Model

Dependent Variable: Natural Logarithm of Sales Price

Variable	Coefficient	*T*-value
y05	0.073 (0.003)	22.611**
neartown	-0.005 (0.007)	-.663
neartown05	0.005 (0.012)	.393
house	0.059 (0.005)	12.895**
bdrms	0.009 (0.003)	2.717**
lsqrft	0.448 (0.026)	16.902**
cars	0.051 (0.004)	11.793**
attgar	0.067 (0.006)	10.382**
baths	0.011 (0.003)	3.274**
stories	-0.027 (0.005)	-5.649**
age	-0.003 (0.000)	-11.138**
agesq	0.000035 (0.000004)	8.75**
fireplaces	0.008 (0.004)	2.061**
unit5	-0.031 (0.008)	-3.494**
lakeview	0.062 (0.013)	5.076**
trail	0.006 (0.008)	.752
histdistrict	0.044 (0.031)	1.431

Number of Observations = 1,044, $R^2 = .850$.

Note: Standard Errors are reported in parentheses. *T* statistics reported in Column 3 have been corrected for heteroskedasticity using the Hal White Technique.

*Significant at $\alpha = 0.10$

**Significant at $\alpha = 0.05$

Variables of Interest

House prices appreciated by 7.3% between 2000 and 2005. According to local realtors, the housing market in the Town of Normal has been strong in the past 10 years- if anything, 7.3% is lower than anticipated. From the coefficient on *neartown*, a house located near the downtown in 2000 sold for 1.7% less than houses sold in 2000 located away from downtown, but with a *t* statistic of .663, the result is not significant. Also, the coefficient on *neartown05* indicates that houses sold near the downtown after redevelopment construction projects were underway (2005) were .46% higher than those sold farther away from the downtown. However, at critical values of both .05 and .10, *neartown05* is not significant. These results indicate the downtown redevelopment effort has not had a significant effect on house prices, both before construction had begun (2000) and during the construction process (2005).

Explanation of results

From the regression, *stories* has a negative and statistically significant relationship with *lsalesprice*. If the house's number of stories (floors) increases by one, the sales price of a house decreases by 2.7%. Style of a house may be a reason for the negative relationship. For example, some houses are "ranch" style, with only one story but a considerable amount of square feet. Certain homes may have fewer stories but more square feet. The variable *unit5* yielded unexpected results. From its coefficient, living in a house within the Unit 5 school district causes price of a house to decrease by 3.1%. However, this result should be approached with caution- only six houses, or.005%, were located outside the Unit 5 school district. These six may not accurately reflect the true nature of the relationship between school district and sales price.

Neither *trail* nor *histdistrict* were significant. However, when looking closer at the dataset, this appears plausible. Of the houses located near the Constitution Trail, several were

sold at the low range, mid range, and high range of all prices- living next to the trail does not seem to positively or significantly affect price. Also, the variable *histdistrict* is used to measure positive spillover effects from being located near a historic district, not within the district itself. ecause *histdistrict* is not significant, it appears there are no significant positive spillover effects (at least in terms of increasing property values) from being located near a historic district.

From the coefficients on *cars* and *attgar*, it is clear that house price is significantly affected by the style of the garage on the property. If a garage can accommodate one additional car (i.e. a two-car garage compared to a one-car garage), then sales price of a home increases by 5.1%. For a $160,000 house (the approximate mean of all sales prices), this translates to an increase of $8,160. Having an attached garage causes similar effects- if a house has an attached garage (*attgar*), then relative to those that do not, price of the house will be 6.7% higher. Other variables that considerably affected sales price are *lakeview*- if a home had a view of a lake or pond, the price of the house increased by 6.3%; and *house*- if the property is a house, then its price will be 5.9% higher than other residences that are not. Variables having a positive and statistically significant effect in previous hedonic pricing studies, *bdrms*, *lsqrft*, *baths*, *age*, and *fireplaces* produced similar results in this study.

It is interesting to note the effect of *age* on *lsalesprice*, using the quadratic *agesq*. The effect of age on sales price varies with the age of each house. For houses with ages of less than 43 years, as age increases, prices decrease. As age increases for houses older than 43 years, prices will increase.[13] This relationship may capture the positive historic effects specific properties possess. As stated earlier, there were no positive spillover effects from houses located

[13] This calculation is performed by taking the absolute value of the coefficient on *age* and dividing it by twice the coefficient on *agesq*, giving $age^* = \frac{.003}{(2 \bullet .000035)} \approx 43$

near a historic district. The effect of *agesq*, however, indicates that individual houses with historic features may cause their prices to increase. [14]

Equation (2) represents the parsimonius model that is estimated after dropping the insignificant variables *neartown*, *neartown05*, *trail*, and *histdistrict*. Note that the equation omits the difference-in-difference estimator to arrive at a standard hedonic pricing model.

Equation (2) – Parsimonius Model

$$\ln P_i = \beta_0 + \delta_0 y05 + \varphi X_i + u_i$$

Results from (2) are reported in Table 4.

***Explanation of Results from* Equation (2)**

Results indicate that all variables except *unit5* are significant. The coefficient on *y05* in Table 4 signifies that house prices increased 7.4% between 2000 and 2005, similar to the result reported from Equation (1). Looking at the standardized (beta) coefficients reported in Column 4, *lsqrft* was the most "important" factor composing house price, followed by *agesq*, *y05*, and *cars*. These results demonstrate that the Normal housing market values most the size of the house and garage, marginal effects of age, and the year the house was built. The Town of Normal's housing market has boomed over the previous five years, and there is much new construction. These results could be reflecting growth on the north and east side of town, areas with several large subdivisions- more expensive houses in these areas are generally newer, compose a large amount of square feet, and have garages accommodating at least two cars.

Results might also be reflecting a trend in the American housing market towards larger homes located further away from central cities. Recently, National Public Radio (NPR) reported the average American house has 2,349 square feet, more than double the size of a house sold in

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[14] A separate regression was run without *agesq*. However, because the adjusted R^2 was greater with *agesq*, the predictive ability of the model is better, and *agesq* was kept.

VI. CONCLUSIONS

Downtown revitalization does not appear to have had a significant effect on surrounding neighborhoods' house prices, over the 2000 to 2005 period. This result is contrary to previous studies analyzing the effects of public projects on house prices and may indicate that benefits from downtown redevelopment are more prevalent within the downtown itself, rather than in nearby areas. Also, because the variables (*lsqrft*, *agesq*, *y05*, *cars*) having the strongest influences on house price are commonly found in the Town's new subdivisions, it is reasonable to conclude that demand is strongest for houses in these neighborhoods. Demand for subdivisions in the Town of Normal indicates that, at least in this market, residents prefer suburbs to central city locations.

One possible reason for this preference is that suburban areas may have an amenity advantage over central Normal locations (houses near the downtown). Brueckner *et al.* (1999) point out that the "marginal valuation of amenities rises sharply with income" [20], indicating that residents with higher incomes will locate to areas offering the most amenities. According to Brueckner *et al.*, there are three categories of amenities: 1) natural- topographical features of the region, 2) historical- monuments and urban infrastructure that are aesthetically pleasing, and 3) modern amenities- restaurants and public facilities such as swimming pools or recreation complexes. In American cities, modern amenities generally have stronger effects than historical and topographical amenities. Consequently, as in the case of the Town of Normal housing market where most restaurants are located on the eastern side of the community, proximity to restaurants and modern public facilities has a stronger effect.

Another reason the downtown redevelopment effort may not be affecting house prices in nearby residential areas is because not enough phases of the redevelopment plan have been

completed. Previous studies have indicated that public projects significantly affect the price of residential houses, before, during, and after construction. Although results from this study indicate there are no significant effects on residential house prices before and during construction, it does not mean there will not be effects on house prices in the future. To gauge the total effect of the downtown redevelopment project on house prices, this study should be undertaken in five or ten years, after all renovation projects have been completed.

There is one important caveat in treating these results as conclusive, however. Although this study showed downtown redevelopment to have no effect on residential house prices, the analysis only represents the Town of Normal housing market. Housing markets are heterogeneous, and one should be cautious about translating these results to other housing markets in the United States.

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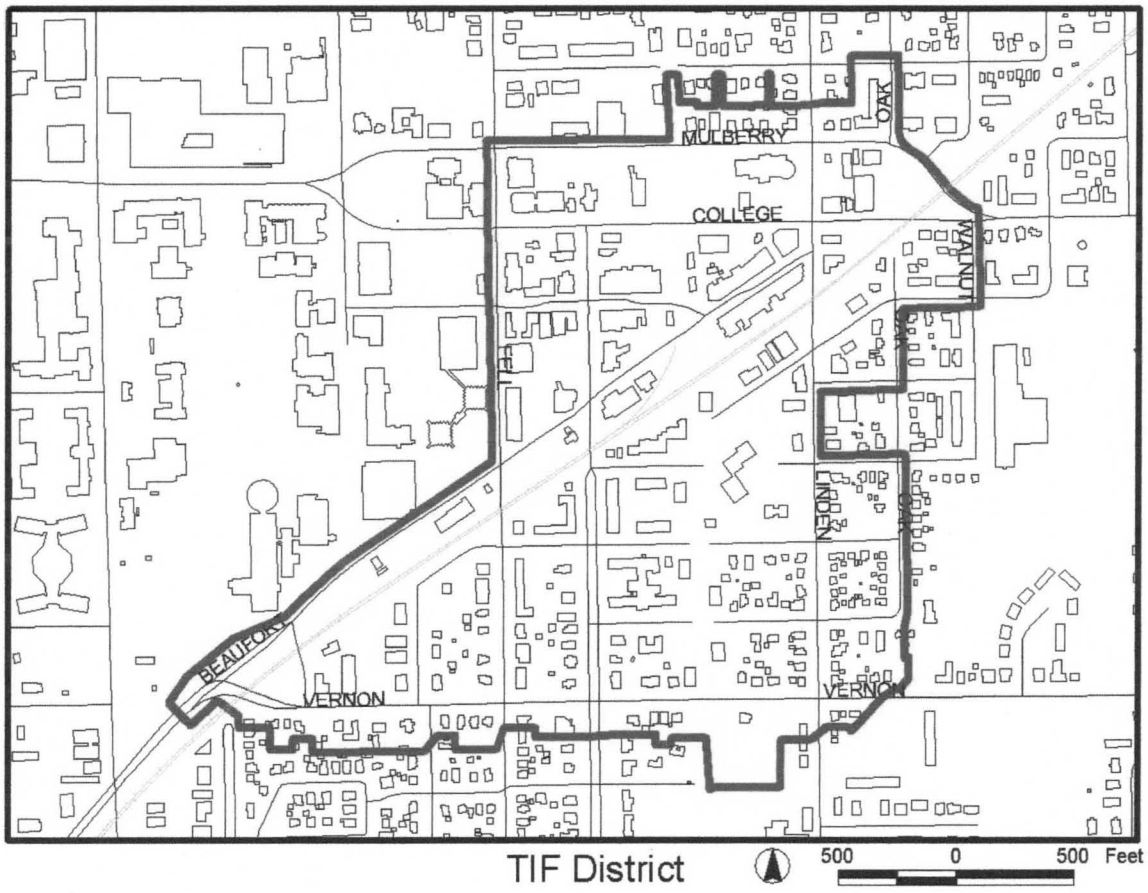
VII. APPENDIX

Figure 1: Map of Downtown Normal and Renewal Projects Completed

Source: Town of Normal (http://www.normal.org/Downtown/Map.asp)

Figure 2: Town of Normal Tax Increment Financing District



Source: Town of Normal (http://www.normal.org/Downtown/TIF.asp)

Figure 3: List of Neighborhoods in the Town of Normal

Aspen Trails	Beacon Hill	Beechwood Commons	Beltline
Bren-Mar	Brightview	Brookwood	Bunker Hill
Bunker Hill North	Carriage Hills	College Park	Collie Ridge
Den 2 North	Den 2 South	Eagle's Landing	East Normal
Fairview	Franklin Heights	Garden Park	Golfcrest
Green Acres	Greenbriar	Greenview Heights	Greenview West
Hanover Heights	Heather Ridge	Holiday Hills	Illinois State University
Ironwood	Kelley Glen	Key West	Lakeview
Lakeview Estates	Landmark	Linden Place	Linfell
Maplewood	Mission Hills	Normal	North Bridge
North Fields	North Normal	Northbrook	Northpark
Northtown	Oakdale	Park Place	Park West
Parkside	Parkside East	Pheasant Ridge	Pineridge
Pinehurst-Normal	Pleasant Hills	Pleasant Hills North	Ridgemont
Robinwood	Savannah Green	Sherwood	South Normal
Stratford Estates	Sugar Creek	The Fields	The Pines
Towanda Park Place	Tramore	University Estates	University Park
University Park North	University Terrace	Vernon Crossing	West Normal
Westbrook	Windsor Crest	Wintergreen	